

Case 2251

***Bucephalus* Baer, 1827 and *B. polymorphus* Baer, 1827 (Trematoda): proposed conservation in their accepted usage**

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Abstract. The purpose of this application is to conserve in their accepted usage the generic and specific names of an important trematode parasite of freshwater fishes — *Bucephalus polymorphus* Baer, 1827. The name *B. polymorphus* was based on cercariae, but it has been shown that these develop into the adult trematode first named as *Rhipidocotyle campanula* (Dujardin, 1844), a senior synonym of *R. illensis* (Ziegler, 1883). A neotype for *B. polymorphus* is proposed to avoid transfer of this long recognized name to *R. campanula*, with resulting confusion at both generic and specific levels.

1. In European freshwater fishes two common species of trematodes of the family BUCEPHALIDAE, known as *Bucephalus polymorphus* Baer, 1827 and *Rhipidocotyle illensis* (Ziegler, 1883), have been recognized. It had been assumed that the adult form called *Bucephalus polymorphus* developed from the cercaria described under this name by Baer in 1827, but the cercaria of the trematode now known by that name was not described until recently, although it was figured by Kinkelin et al. (1968).

2. While studying the biology of these two species, both of which occur in Poland, I examined bivalves (the first intermediate host), cyprinid fishes (the second intermediate host) and predatory fishes (the definitive host). I found two different cercariae from which I experimentally obtained the metacercariae of two species, but the metacercariae of *Rhipidocotyle illensis* developed from cercariae identical with those described by Baer as *Bucephalus polymorphus*. Detailed data on the morphology of all developmental stages can be found in Baturó (1977).

3. As a result of this study it has become necessary to set in order the names of these two species of Trematoda. For stability of nomenclature it is necessary to maintain the

An application for the conservation of the nominal taxa *Bucephalus* and *B. polymorphus* was received from Dr Baturó on 27 February 1978. Extensive correspondence took place between her and the then Secretary of the Commission (Mr R.V. Melville), and a revised version of her application was published in July 1979 (BZN 36: 30–36). A comment opposing Dr Baturó's application was received from Dr C.B. Srivastava (*Zoological Survey of India*) on 5 January 1981. Further extensive correspondence took place, with efforts to reconcile points of difference between Dr Baturó and Dr Srivastava. This correspondence eventually lapsed without publication of Dr Srivastava's comment and without the Commission voting upon Dr Baturó's application. In view of its importance, the case has now been reopened. Dr Baturó's application is here reprinted with some modifications. A condensed version of Dr Srivastava's comment is published on BZN 49: 62–66, together with comments in support of Dr Baturó's application from Dr D.I. Gibson (*Parasitic Worms Division, The Natural History Museum, London*), Dr O.N. Pugachev (*Parasitic Worms Department, Zoological Institute, Academy of Sciences, St Petersburg*) and Professor J.C. Pearson (*Department of Helminthology, University of Queensland*).

name *Bucephalus polymorphus*, commonly used and accepted in all keys, textbooks and monographs. The other species, which belongs to the genus *Rhipidocotyle* Diesing, 1858 (p. 313), should under the Principle of Priority be called *R. campanula* (Dujardin, 1844), although it has been known by the junior subjective synonym *R. illensis* (Ziegler, 1883). The history of the case is as follows.

4. Baer (1827, p. 570) established the genus *Bucephalus* for the new species *B. polymorphus* (the type species by monotypy). He based the description on sporocysts and cercariae from the bivalves *Anodonta mutabilis* and *Unio pictorum*.

5. In 1844 Dujardin described from the intestine of the pike (*Esox lucius*) small adult trematodes which he thought represented the same species as metacercariae that he had earlier found on the branchia of *Cyprinus idus*. He classified them in the genus *Distoma* Retzius, 1786 and gave them the new specific name *campanula* (p. 435). Dujardin's description of the anterior organ suggests that he was dealing with the adult trematode usually known by the name *Rhipidocotyle illensis* (Ziegler, 1883).

6. Siebold (1848) gave the first short description of an adult trematode from the intestine of *Perca fluviatilis* and *Lucioperca* sp., and erected the new genus *Gasterostomum* for it with the new species *fimbriatum*. Siebold expressed the assumption that the cercaria described by Baer as *Bucephalus polymorphus* was a larva of this adult stage.

7. Wagener (1852, 1857, 1858) gave a more accurate description of *Gasterostomum fimbriatum*, together with drawings of the adult stages. He stated (1852) that *G. fimbriatum* was characterised by five tentacles on the anterior organ. In his next work (1857) he presented drawings and said that *G. fimbriatum* Siebold was probably a synonym of *Bucephalus polymorphus* Baer. A year later Wagener considered *G. fimbriatum* Siebold and *Distoma campanula* Dujardin to be synonyms of *B. polymorphus*. He regarded *G. fimbriatum* Siebold as a sexually mature and tail-less *B. polymorphus* Baer.

8. Ever since Wagener's papers, the view has been adopted that the adult trematode *G. fimbriatum* Siebold, characterised by the presence of long tentacles on the sucker, develops from the cercariae described in 1827 under the name *Bucephalus polymorphus*. Diesing questioned this view in 1858, but because of erroneous interpretations by this author in other matters his works have not been taken into account.

9. In 1883 Ziegler obtained metacercariae experimentally by infecting the cyprinid *Leuciscus erythrophthalmus* with *B. polymorphus* cercariae developed in the mussel *Anodonta mutabilis* from the Ille river. In describing and illustrating the material obtained, he pointed out the morphological differences between the specimens reared and *G. fimbriatum* Siebold, but he did not determine unequivocally the specific distinction of these two forms. He stipulated, however, that, in case the differences observed by him should prove to be specific differences, he proposed to call the reared form *Gasterostomum illense* (p. 542, footnote).

10. Lühe (1909) considered *G. fimbriatum* as a synonym of *B. polymorphus* Baer, but the description and drawing included in the key correspond to *illensis*. Similarly, Eckmann (1932) acknowledged the existence of only one species, recognising *G. fimbriatum* as a synonym of *B. polymorphus* and questioning whether the form obtained by Ziegler was a separate species. Eckmann (1932) also studied the type

specimens of *Gasterostomum galeatum* (Rudolphi, 1819) and *G. minimum* Wagener, 1852 and synonymized them, thereby making *G. galeatum* the valid name of the type species of *Rhipidocotyle* Diesing, 1858.

11. A return to the former concept of the occurrence of more than one species of BUCEPHALIDAE in European freshwater fishes dates from the work of Koval (1949), who recorded two species in the fishes of the Dnieper river. She described one of them as a new species, *Bucephalus markewitschi* (p. 206), and used the name *B. polymorphus* Baer for the second species, which corresponds with *G. illense* Ziegler.

12. This taxonomic arrangement was not accepted. Vejnar (1956), for example, asserting the existence of two species of trematodes in percid fishes, regarded the form with tentacles as *B. polymorphus* Baer and identified the other species with the forms described by Ziegler. He transferred this species to *Rhipidocotyle*, using the combination *Rhipidocotyle illense* [sic] (Ziegler, 1883). Vejnar's view was supported by Kozicka (1959), who included in her work the history of the study of one of these trematodes, together with detailed descriptions and drawings of adult worms of both species. Kozicka treated the name *B. markewitschi* Koval as a synonym of *B. polymorphus* Baer. The characters mentioned by Kozicka as differentiating the two taxonomic species have become key characters and are quoted in all recent monographs and keys (e.g. Skrjabin, 1962; Yamaguti, 1971; Bykhovskaja-Pavlovskaja et al., 1962; Ergens & Lom, 1970).

13. Dollfus (1968) discussed the problems of synonymy once again. Presenting the documentation of the manuscript of the chapter on trematodes from Dujardin's *L'Histoire naturelle des Helminthes*, he drew attention to the similarity of the drawing of *Distoma campanula* made by Dujardin to *Rhipidocotyle illensis* and proposed the combination *Rhipidocotyle campanula* (Dujardin, 1845) as the valid name for this species.

14. Kinkelin et al. (1968), in a study of the pathogenic effects of cercariae, presented photographs of three developmental stages. Cercariae from the bivalve *Dreissena polymorpha* differ from *B. polymorphus* cercariae from *Anodonta mutabilis* and *Unio pictorum* drawn by Baer. The metacercariae and adults are characterised by finger-like tentacles on the anterior sucker. Although the authors did not discuss this problem in their paper, thanks to their correct documentation the adult stage with finger-like tentacles on the anterior sucker ('*Bucephalus polymorphus*' auct.) was for the first time associated with its corresponding cercaria. My study (Baturó, 1977) confirms that these are successive developmental stages of one species.

15. Thus, in accordance with the Principle of Priority, the species commonly known as *Rhipidocotyle illensis* (Ziegler, 1883), whose adult develops from cercariae described by Baer (1827), should bear the name *polymorphus* Baer, 1827, while the forgotten name *fimbriatum* Siebold, 1848, should be restored for the species widely known as *Bucephalus polymorphus* Baer, 1827. At the same time, it would be necessary to regard the generic name *Rhipidocotyle* Diesing, 1858, as a synonym of *Bucephalus* Baer, 1827, and to use the forgotten name *Gasterostomum* Siebold, 1848 for the genus known at present as *Bucephalus*.

16. The introduction of such changes in accordance with the Principle of Priority would conflict with current usage. The key characters of trematodes are based on the morphology of the adults and metacercariae, not on the cercariae. Likewise, most data in the literature concern these two developmental stages. Both species are common

parasites of fishes and are widely met as metacercariae and adults. For many practising parasitologists the cercariae from which the metacercariae and adults develop are often unknown — as witness the paper by Kinkelin et al. (1968) in which the authors, presenting adequate photographic documentation, did not observe the fact that they were dealing with unknown cercariae. Strict application of the Principle of Priority to the nomenclature of these common fish parasites would lead to much confusion and erroneous identification of material.

17. Through the co-operation of Dr G. Hartwich, syntypes of *G. fimbriatum* Siebold, 1848 have been found in the Zoological Museum, Humboldt University, Berlin. By designating one of these as the lectotype of *G. fimbriatum* (and in 1979 I designated microscopic preparation No. 1655b in the first printing of this paper in BZN 36: 33) and also as the neotype of *Bucephalus polymorphus* Baer, 1827, stability of nomenclature can be achieved. The latter action, however, can only be taken by the Commission under its plenary powers, because the proposed neotype is not 'consistent with what is known of the former name-bearing type' as is required under Article 75d(4) of the Code.

18. Before putting precise proposals to the Commission, it is desirable to clarify the status of the genus *Rhipidocotyle* Diesing, 1858. This was proposed by Diesing (1858, pp. 313, 361) with two included species, *Distoma gracilescens* Rudolphi, 1819 (pp. 111, 409) and *Gasterostomum minimum* Wagener, 1852 (p. 558), neither of which was designated as type species. According to Eckmann (1932, p. 99), Stiles & Hassall (1908, p. 358) were the first authors to cite a type species, and chose *gracilescens*. However, Stiles & Hassall only said '(type probably *gracilescens*)', and under Article 67c(3) that cannot be accepted as a valid designation. Nicoll (1914, p. 490) definitely designated *Gasterostomum minimum* Wagener, 1852 (p. 558), and that stands as the first valid type species designation for *Rhipidocotyle*. The valid name for this species is *Rhipidocotyle galeata* (Rudolphi, 1819, p. 86).

19. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to use its plenary powers to set aside all previous fixations of type specimen for the nominal species *Bucephalus polymorphus* Baer, 1827 and to designate microscopic preparation No. 1655b in the Zoological Museum, Humboldt University, Berlin, as neotype of that species;
- (2) to place on the Official List of Generic Names in Zoology the following names:
 - (a) *Bucephalus* Baer, 1827 (gender: masculine), type species by monotypy *Bucephalus polymorphus* Baer, 1827;
 - (b) *Rhipidocotyle* Diesing, 1858 (gender: feminine), type species by subsequent designation by Nicoll (1914) *Gasterostomum minimum* Wagener, 1852 (a junior subjective synonym of *Monostoma galeatum* Rudolphi, 1819);
- (3) to place on the Official List of Specific Names in Zoology the following names:
 - (a) *polymorphus* Baer, 1827, as published in the binomen *Bucephalus polymorphus* (specific name of the type species of *Bucephalus* Baer, 1827) and as defined by the neotype designated in (1) above;
 - (b) *galeatum* Rudolphi, 1819, as published in the binomen *Monostoma galeatum* (senior subjective synonym of the specific name of the type species of *Rhipidocotyle* Diesing, 1858).
 - (c) *campanula* Dujardin, 1844, as published in the binomen *Distoma campanula*;

- (4) to place on the Official Index of Rejected and Invalid Generic Names in Zoology the name *Gasterostomum* Siebold, 1848 (a junior objective synonym of *Bucephalus* Baer, 1827);
- (5) to place on the Official Index of Rejected and Invalid Specific Names in Zoology the name *fimbriatum* Siebold, 1848, as published in the binomen *Gasterostomum fimbriatum* (a junior objective synonym of the specific name of *Bucephalus polymorphus* Baer, 1827).

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